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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 10/609,627 | 07/01/2003 | Iwao Yoshida | 023971-0288 | 4984 |
| 22428 | 7590 | 11/17/2004 | EXAMINER | |
| FOLEY AND LARDNER SUITE 500 3000 K STREET NW WASHINGTON, DC 20007 | | | TRAN, DIEM T | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 3748 | |

DATE MAILED: 11/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/609,627

Applicant(s)

YOSHIDA, IWA0

Examiner

Diem Tran

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-5,9,17-19,23-27,30,34 and 35 is/are rejected.
- 7) ☒ Claim(s) 6-8,10-16,20-22,28,29 and 31-33 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-3, 27, 30, 34 are rejected under 35 U.S.C. 102(e) as being anticipated by Boegner et al. (US Patent 6,637,189).

Regarding claims 1, 27, 30, 34, Boegner discloses an exhaust purification apparatus for an internal combustion engine, comprising:

an exhaust gas purification catalyst disposed in an exhaust passage of the engine; and a controller that executes a poisoning release control of the exhaust gas purification catalyst when a predetermined condition is established, the poisoning release control including a normal mode and an exhaust gas composition mode before the normal mode, a manipulation parameter of the engine related to an exhaust gas composition being manipulated in such a manner that a hydrogen concentration in the exhaust gas in the exhaust gas composition mode is higher than that in the normal mode (see Figure 1A, col. 4, lines 6-40).

Regarding claims 2, 3, Boegner further discloses that the mode of the poisoning release control is switched from the exhaust gas composition mode to the normal mode

when a temperature of the exhaust purification catalyst becomes high and is in excess of a first predetermined value (see Figure 1A, col. 4, lines 25-40).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Boegner et al. (US Patent 6,637,189) in view of Yoichi et al. (JP 2001-271685).

Regarding claim 5, Boegner discloses all the claimed limitations as discussed in claim 1 above, however, fails to disclose during the poisoning release control, a fuel injection through a fuel injection valve used in a direct fuel injection is split into the injection under a suction stroke and that under a compression stroke. Yoichi teaches that it is conventional in the art, to utilize splitting a fuel injection through a fuel injection valve into the injection under a suction stroke and that under a compression stroke during the poisoning release control (see abstract).

It would have been obvious to one having ordinary skill in the art, to have utilized the teaching of Yoichi in the apparatus of Boegner, since the use thereof would have increased the temperature of the exhaust gas to recover from sulfur poisoning of a NO_x absorber.

Claim 4, 9, 17-19, 23-26, 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boegner et al. (US Patent 6,637,189) in view of Isobe (U.S. Patent 5,974,792).

Regarding claims 4, 9, Boegner discloses all the claimed limitations as discussed in claims 1, 5 above, Boegner further discloses that the hydrogen concentration in the exhaust gas in the exhaust gas composition mode is higher than (i.e richer than) in the normal mode (see col. 4, lines 6-40); however, fails to disclose that in the exhaust composition mode, an ignition timing is set toward an advance angle direction more than that in the normal mode.

As shown in Figure 1, Isobe teaches a control apparatus for rapidly warming a catalyst, the control apparatus adjusts the fuel injection amount to a rich amount and further retards the ignition timing. As indicated on lines 4-8 of column 20, an ignition timing of the rich cylinders is retarded to suppress engine torque fluctuations. It would have been obvious to one having ordinary skill in the art at the time of the invention was made, to set the ignition timing toward a more retardation direction of richer cylinders in the apparatus of Boegner as taught by Isobe, since the use thereof would have resulted in smooth engine operation.

Regarding claims 17, 19, 23-26, 35, Boegner discloses an exhaust purification apparatus for an internal combustion engine comprising:

an exhaust gas purification catalyst disposed in an exhaust passage of the engine; and a controller that executes a poisoning release control of the exhaust gas purification catalyst when a predetermined condition is established, the poisoning release control including a normal mode and an exhaust gas composition mode before the normal mode,

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however, fails to disclose an ignition timing in the exhaust gas composition mode being set toward a more advance angle direction than that in the normal mode.

As shown in Figure 1, Isobe teaches a control apparatus for rapidly warming a catalyst, the control apparatus adjusts the fuel injection amount to a rich amount and further retards the ignition timing. As indicated on lines 4-8 of column 20, an ignition timing of the rich cylinders is retarded to suppress engine torque fluctuations. It would have been obvious to one having ordinary skill in the art at the time of the invention was made, to set the ignition timing toward a more retardation direction of richer cylinders in the apparatus of Boegner as taught by Isobe, since the use thereof would have resulted in smooth engine operation.

Regarding claim 18, Boegner further discloses that the mode is switched from the exhaust gas composition mode to the normal mode, when a temperature of the catalyst becomes high and is in excess of a first predetermined value (see col. 4, lines 25-40).

Allowable Subject Matter

Claims 6-8, 10-16, 20-22, 28, 29, 31-33 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication from the examiner should be directed to Examiner Diem Tran whose telephone number is (703) 308-6073. The examiner can normally be reached on Monday -Friday from 8:30 a.m.- 5:00p.m.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas E. Denion, can be reached on (703) 308-2623. The fax number for this group is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is

(703) 308-0861.



Diem Tran
Patent Examiner
Art unit 3748

DT
November 12, 2004